On March 23, 1917, a tornado moved in a nearly straight path in an east-northeast direction, cutting a swath through the entire north side of the city of New Albany. The width of the path of practically total destruction varied between 1,000 and 1,500 feet with an area along each side of from 600 to 1,000 feet in which there was a great deal of damage, mostly in spots. The length of the path of the storm was about three and one-half miles, although many articles of furniture and clothing and other débris were found many miles from New Albany, whence they came. In New Albany 41 people were killed or died from injuries received, and several hundred others were injured. Between 200 and 300 houses were destroyed including several manufacturing plants, while several hundred more houses were damaged. Practically 2,500 people, including from 350 to 400 families were made homeless. The storm began at 3:08 p. m. and lasted about five minutes. The property damage was estimated between one and one and a half million dollars. A more detailed report of this storm will appear in a later issue of the MONTHLY WEATHER REVIEW.

In addition to the above, a number of other storms of tornadic character occurred in different parts of the State on the 23d, some of which are as follows:

Over the southern part of Sullivan County, south of Carlyle, at about 1:15 p. m. a tornado swept from west to east, a distance of about 18 miles, killing one man and injuring about 20 others with property damage about $150,000. Width of path of greatest destruction about one-fourth mile.

In the northern part of Hendricks County, west of Pittsboro, at about 1:30 p. m., a tornado did considerable damage to buildings, orchards, etc., width of path of greatest destruction from 40 to several hundred feet.

In the western part of Grant County, west of Swayzee, about 2:30 p. m., a tornado swept southwest-northeast, doing damage in a path about 40 rods wide. One person was injured.

In the eastern part of Delaware County, southeast of De Soto, at about 3:30 p. m., a tornado moved southwest-northeast doing damage to buildings and trees in a path about 700 feet wide. Two persons were injured and property damaged about $2,500.

In the northern part of Adams County, near Preble and Magley, at about 2:55 p. m., a tornado swept a path about 200 feet in width, causing property damage amounting to about $5,000, and injuring two people.

In the central part of Harrison County, about 1 mile north of Corydon, at about 3:30 p. m., a tornado having a path from one-fourth to one-half mile wide did considerable damage to buildings on farms. Twenty persons were injured, but none were killed.

Illinois.—On March 23, storms of a tornadic nature visited Johnson and Crawford counties. In the first-named, buildings were damaged somewhat and two persons were injured, but in the southeastern part of Crawford County the storm was the worst on record. Several persons were injured, and the property loss amounted to several hundred thousand dollars.

Kansas.—Tornadoes were reported near Carlyle and Howard on the evening of March 22. The one near Carlyle occurred about 8 p. m. and moved from southwest to northeast. The width and length of its path could not be ascertained, though neither was great. The funnel-shaped cloud was distinctly seen. No person was injured, but property damage amounted to about $2,500.

The tornado near Howard on the same date formed to the southwest of that town between 5 and 6 p. m. and moved northeastward, passing in the vicinity of the town itself. The characteristic cloud was plainly seen. The damage was confined to small farm buildings and did not amount to more than a few hundred dollars. No persons were injured.

Kentucky.—The tornado that visited New Albany, Ind., on March 23, jumped to Harrod's Creek, Ky., as will be reported in the REVIEW for April, 1917.

Ohio.—On March 11, 1917, a tornado occurred in the vicinity of Cincinnati, and two others passed over western Montgomery County. A detailed report of these storms will be found on pages 115–8 of this issue of the REVIEW.

Tennessee.—A severe local storm did considerable damage near Pleasant Point and Dunn, in Lawrence County, during the afternoon of March 16. A number of houses and barns were wrecked and several persons were seriously injured, one probably fatally.

About 5 p. m. of the 23d a storm moved in a northeasterly direction across Trousdale County, destroying considerable property along a path 200 yards wide and 4 miles southeast of Hartsville. Several persons were injured. Both storms were probably tornadoes of a mild character.

Average accumulated departures for March, 1917.

Districts.	Temperature.			Precipitation.			Cloudiness.		Relative humidity.	
	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure from the normal.	General mean for the current month.	Departure from the normal.
	° F.	° F.	° F.	In.	In.	In.	0–10		P. ct.	
New England	33.2	+0.3	− 3.0	3.93	+0.20	−1.20	5.6	−0.1	74	− 1
Middle Atlantic	41.0	+0.9	+ 0.8	4.46	+0.80	−0.70	5.6	−0.1	71	− 2
South Atlantic	55.1	+1.1	+ 6.0	3.81	−0.70	−2.80	5.0	+0.1	73	− 2
Florida Peninsula	72.3	+2.1	+ 5.4	2.08	−0.10	−3.90	3.8	+0.1	74	− 4
East Gulf	59.3	+2.1	+ 8.4	6.59	+0.80	+1.50	5.3	+0.2	71	− 4
West Gulf	59.0	+1.2	+ 7.6	1.72	−1.40	−4.30	5.5	+0.4	67	− 5
Ohio Valley and Tennessee	45.0	+1.1	+ 0.7	6.35	+1.90	+2.00	5.7	−0.4	69	− 3
Lower Lakes	34.9	+1.9	− 4.0	2.69	+0.10	−1.00	6.3	−0.2	73	− 3
Upper Lakes	29.4	+1.8	− 9.1	2.44	+0.20	−1.40	6.2	+0.2	78	0
North Dakota	23.1	+2.5	− 7.1	0.44	−0.50	−0.40	5.1	−0.4	82	+ 4
Upper Mississippi Valley	38.0	+2.0	− 4.4	2.66	+0.30	−1.10	5.8	+0.1	70	− 4
Missouri Valley	37.8	+1.7	+ 2.2	1.90	0.00	−0.80	4.8	−0.7	68	− 2
Northern slope	25.3	−5.6	− 9.4	0.92	−0.20	−0.10	5.1	−0.3	69	+ 1
Middle slope	41.8	−0.7	+ 3.5	0.35	−0.60	−1.40	3.6	−1.1	55	− 6
Southern slope	53.4	+0.2	+ 5.5	0.22	−0.70	−1.50	2.9	−1.4	38	−16
Southern Plateau	46.4	−4.5	− 8.6	0.17	−0.40	−0.60	1.5	−2.2	37	− 4
Middle Plateau	33.7	−7.2	−23.2	0.83	−0.40	−1.10	4.3	−0.7	54	− 4
Northern Plateau	32.7	−7.5	−12.9	0.97	−0.60	−1.30	7.0	+1.2	68	+ 2
North Pacific	41.1	−3.5	− 5.7	4.64	0.00	−4.10	5.2	−1.4	81	+ 2
Middle Pacific	47.9	−3.5	− 7.0	1.77	−2.40	−4.20	3.3	−2.0	66	− 9
South Pacific	54.0	−1.7	− 3.4	0.36	−2.20	−1.30	2.2	−2.4	62	− 9

551.506 (261.1)

WEATHER CONDITIONS OVER THE NORTH ATLANTIC OCEAN DURING MARCH, 1916.

The data presented are for March, 1916, and comparison and study of the same should be in connection with those appearing in the REVIEW for that month. Chart IX (XLV–27) shows for March, 1916, the averages of pressure, temperature, and prevailing direction of the wind at 7 a. m., 75th meridian time (Greenwich mean noon), together with notes on the locations and courses of the more severe storms of the month.

PRESSURE.

The distribution of the average monthly pressure as shown on Chart IX differed from the normal in several respects. The Azores, or North Atlantic HIGH, with a crest of 30.05 inches, was somewhat south of its usual position and slightly below the normal in intensity. One of the most unusual features was a HIGH, surrounded by the isobar of 30.00 inches, central near the south coast of Iceland, where the normal pressure is about 29.5 inches. A third HIGH, with a crest of 30.1 inches, and of limited area, covered a portion of southern Florida. A LOW of 29.7 inches was central near St. Johns, N. F., and there was a second LOW of similar intensity off the coast of Europe, extending as far west as the 12th meridian. South of the 50th parallel and east of the 55th meridian, the average pressure for the month was considerably lower than usual, while over the western division, it was not far from the normal.

The pressure changes from day to day were marked, showing the usual variable characteristics common in March. The average pressure for the three decades of the month varied considerably over different portions of the ocean. In some mid-ocean regions the average for the last decade was considerably below that of the monthly, while in the waters adjacent to the American coast there was but little difference in the averages of the three decades, although the daily fluctuations were considerable. In the 5-degree square that includes the Faroe Islands the average for the first decade was 30.11 inches, the second 30.09 inches, and the last 11 days, 29.53 inches; the highest reading being 30.37 inches, on the 7th, and the lowest 28.72, inches on the 25th. In southern European waters, the pressure for the last decade was greater than for the first two, as in the square between latitude 35°–40°, longitude 5°–10° west, the average pressure for the first decade was 29.76 inches, the second, 29.68 inches, and the last 11 days 30.02 inches, the monthly mean being 29.82 inches. The extreme range for the month was, as usual, not so great as in northern waters, the highest reading being 30.43 inches, on the 30th, and the lowest, 29.20 inches, on the 10th. In the square between latitude 45°–50°, longitude 35°–40°, there was comparatively little difference in the pressure averages for the three decades of the month, as they were, 29.77 inches for the first, 29.80 inches for the second, and 29.73 inches for the last 11 days: the lowest reading was 29.26 inches on the 31st, and the highest, 30.21 inches on the 18th. In the square adjacent to the American coast, between the 40th and 45th parallels, there was also but little variation in the averages, and the extreme range was also comparatively small, the lowest reading being 29.20 inches on the 4th, and the highest, 30.10 inches, on the 31st. In the square that includes the Bermudas, the averages were as follows: First decade, 30.07 inches; second decade, 30.01 inches; last 11 days, 29.85 inches: the lowest reading was 29.60 inches, on the 4th, and the highest, 30.22 inches, on the 6th. In the Gulf of Mexico, the variation was somewhat greater than usual, as shown by the figures for the square between latitude 25°–30° and longitude 90°–95°, which are as follows: Average for the first decade, 30.04 inches; second decade, 30.17 inches; and last 11 days, 29.96 inches. The lowest reading was 29.78 inches, on the 25th, and the highest 30.40 inches, on the 16th.

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GALES.

Weather conditions over the North Atlantic in March are usually uncertain and changeable, and March, 1916, was no exception to the general rule. Over the northern steamer routes, the number of gales, for the most part, was considerably below the normal, while in the limited territory between the 35th and 40th parallels, and the 50th and 70th meridians, the conditions were reversed, this region being visited by an exceptionally large number of gales during the month. The largest number was reported from the 5-degree square between latitude 35°–40° and longitude 60°–65°, where they occurred on 13 days, a percentage of 42, while the normal percentage is 21. Along the American coast the number of days on which gales were reported was near the normal, while in European waters they were less frequent than usual. In the region directly north of the Bermudas, where the heaviest weather prevailed, the gales occurred in all periods of the month, although there were not quite as many in the middle as in the first and last decades.

On Chart III, Tracks of Centers of Low Areas, March, 1916 (XLIV–27), a LOW (I on Chart IX) is shown on the morning of February 29, central near Salt Lake City, Utah. On the morning of March 2 this disturbance was near Norfolk, Va., but it was of slight intensity, and only light to moderate winds prevailed along the American coast. On the same day a second LOW existed in the vicinity of St. Johns, N. F., although it was impossible to determine its northern limits on account of lack of observations. Westerly gales of about 50 miles an hour were reported by a number of vessels between the 45th and 50th parallels, and the 40th and 50th meridians, while heavy snow occurred 5 degrees south of the storm area. The first LOW (I on Chart IX) moved rapidly during the next 24 hours, and on the 3d the center was near latitude 43°, longitude 55°. It was now well developed; the barometer had fallen to 29.35 inches, while strong gales, attended by snow, were prevalent over a limited area. The path of this disturbance then curved slightly toward the north, and continuing in its rapid rate of movement it reached, on March 4, a point near latitude 50°, longitude 35°. The lowest barometer reading was 29.23 inches, and two vessels reported gales of 55 and 64 miles an hour, respectively. This LOW proceeded in an easterly direction, and on the 5th was near latitude 50°, longitude 22°; the barometer had risen to 29.63 inches, and light to moderate winds prevailed within the area of low pressure. On March 3, a LOW (II on Chart IX) was central near Wilmington, N. C., where the barometer reading was 29.70 inches. The storm was of slight intensity, but snow occurred off the Virginia coast. The disturbance increased in force, and by the 4th the storm area extended from the 35th to the 44th parallels, and the 55th to 70th meridians, where gales of from 40 to 75 miles an hour prevailed, attended by snow and hail, the lowest barometer reading being 28.63 inches. The disturbance then curved sharply toward the northeast, and on the 5th the apparent center was over western Newfoundland, although it was impossible to locate it accurately on account of lack of observations. The barometer had risen slightly, and the storm area now extended as far east as the 45th meridian, although the winds were not

as violent as on the day before, the maximum velocity being 55 miles an hour. It then moved slowly toward the east, decreasing in intensity and increasing in extent, and the center on the 6th was in the vicinity of St. John's, N. F. The area of heavy winds was considerably less than on the 5th, although west and northwest gales, with hail and snow, were reported from a few vessels between the 35th and 42d parallels, and the 50th and 61st meridians. The disturbance then increased rapidly in its rate of movement, and on the 7th the center was near latitude 47°, longitude 38°. Three vessels, about, 5 degrees west of the center, encountered moderate northwest gales, accompanied by hail, and a few isolated reports of heavy winds were also received from the southern quadrants. On the 8th it was central near latitude 45°, longitude 27°, where the conditions of wind and weather had moderated considerably since the previous day. By the 9th, the center was near latitude 42°, longitude 16°, but the storm area had expanded considerably, as three vessels in the vicinity of the Azores encountered moderate to strong gales. The disturbance then decreased in its rate of translation, and increased in intensity, and on the 10th the center was about 4 degrees west of Vigo, Spain, the lowest barometric reading being 28.85 inches. Moderate to strong gales were interspersed with winds of less velocity throughout a large territory between the 35th and 50th parallels, and the 25th meridian and the European coast. The disturbance continued in its easterly movement, losing somewhat in intensity, and on the 11th it was over central Spain. A few vessels between the 35th and 50th parallels, east of the 20th meridian, encountered moderate northeasterly to northwesterly gales, although as a whole the winds were not as violent as on the day before. From the 12th to the 14th the storm moved but little, as its center during that period remained between the 45th and 50th parallels, and the 15th meridian, West longitude, and that of Greenwich. Only light to moderate winds prevailed in that territory, although on the 14th moderate northwest gales were reported from the vicinity of the Azores.

On Chart III, for March, 1916, referred to previously, a LOW (III on Chart IX) is shown on the evening of March 10, near Edmonton, Alberta. This moved across the country with a fairly uniform rate of translation, and on the morning of the 13th, the center was near Portland, Me. Light to moderate winds prevailed along the American coast, while snow was reported north of the 40th parallel, and west of the 55th meridian. This disturbance moved very rapidly during the next 24 hours, and on the 14th the center was near latitude 43°, longitude 52°, and moderate to strong gales prevailed over a small area in the southerly quadrants. From the 14th to the 17th its movement was somewhat reduced, curving to the south on the 15th and recurving toward the north by the 17th, so that it was practically on the same parallel of latitude on the 15th and 17th, while on the 16th it had moved considerably to the south, the center being only about 3 degrees north of the Azores. The area of low pressure was well defined during this period, but no winds of high velocity were reported until the 18th, when a number of vessels about 300 miles northwest of the center, which was near latitude 46° and longitude 14°, encountered northeasterly gales of from 40 to 65 miles an hour. On the 19th it curved slightly toward the northeast, and proceeded with a diminished rate of movement and energy, until the 21st, when it was central near the English Channel. This track was remarkable for its great length, although the path of the LOW was not accompanied by any unusual conditions of wind and weather.

On the 22d a LOW of limited dimensions was central near Washington, D. C., accompanied by light to moderate winds with some snow. This disturbance moved in a northeasterly direction, and on the 23d the center was about 100 miles southeast of Halifax, where the barometric reading was 28.92 inches. Moderate to strong gales covered an extensive area between the center and the 35th parallel, extending as far east as the 55th meridian. By the 24th the center was near the coast of Newfoundland, with a minimum barometric reading of 29.18 inches, and light to moderate winds. At the same time a HIGH with a crest of 30.20 inches was central near Washington, D. C., and a storm area existed between the 35th and 40th parallels, and the 55th and 60th meridians. From the 25th to the 29th the disturbance moved in an irregular manner over the region between the 35th and 50th parallels, and the 40th meridian and the American coast. On the 27th it reached its greatest intensity and northerly and northwesterly winds of from 40 to 65 miles an hour prevailed over a small area between the 35th and 42d parallels, and the 55th and 65th meridians. On the 28th a few reports were received showing gales, but the storm area was greatly contracted since the previous day. From the 28th until the end of the month this LOW moved slowly in a northeasterly direction, gradually diminishing in intensity.

TEMPERATURE.

The average temperature of the air over the ocean, was as a whole, somewhat below the normal north of the 40th parallel, while south of that line and in the northern part of the Gulf of Mexico, the departures were for the most part, slightly positive, although in the waters adjacent to the American and south Gulf coasts, the temperature was lower than usual. In northern waters the seasonal change in temperature was not so marked as usual, as the thermometer readings for the first part of the month differed but slightly from those taken during the last decade, and in some cases the latter readings were lower than the former.

The temperature departures at a number of Canadian and U. S. Weather Bureau Stations on the Atlantic and Gulf coasts were as follows:

	°F.		°F.
St. Johns, N. F.	−2.3	Norfolk, Va.	−3.6
Sydney, C. B. I.	−2.6	Hatteras, N. C.	−3.0
Halifax, N. S.	−3.3	Charleston, S. C.	−2.0
Eastport, Me.	−4.3	Key West, Fla.	−2.6
Portland, Me.	−5.2	Tampa, Fla.	−2.8
Boston, Mass.	−4.4	New Orleans, La.	+1.8
Nantucket, Mass.	−6.4	Galveston, Tex.	+3.5
Block Island, R. I.	−5.5	Corpus Christi, Tex.	+4.4
New York, N. Y.	−5.3		

FOG.

There was comparatively little fog during the month under discussion, the greatest amount occurring in the 5-degree square between latitude 35°–40° and longitude 45°–50°, where it was observed on 5 days, a percentage of 16, which was considerably below the normal for that region. No fog was reported east of the 30th meridian, while along the American coast it was reported on from 1 to 3 days.

SNOW AND HAIL.

The most frequent occurrence of snow was in the 5-degree square between latitude 40°–45°, longitude 55°–60°, where it was reported on 11 days. Over the waters adjacent to the American coast between the 35th and 45th parallels, snow was observed on from 5 to 6 days, while in mid-ocean, in the vicinity of the steamer lines it was not recorded on more than one day, in any 5-degree square.

There was little hail reported during the month, and in only one square did it occur on more than one day.

Winds of 50 miles per hour (22.4 m./sec.) or over, during March, 1917.

Station.	Date.	Wind.		Station.	Date.	Wind.		Station.	Date.	Wind.		Station.	Date.	Wind.	
		Velocity.	Direction.			Velocity.	Direction.			Velocity.	Direction.			Velocity.	Direction.
		Mls./hr.				*Mls./hr.*				*Mls./hr.*				*Mls./hr.*	
Bismarck, N. Dak.	24	51	nw.	Eastport, Me.	6	50	n.	New York, N. Y.	24	60	nw.	Rapid City, S. Dak.	30	60	n.
Block Island, R. I.	4	53	ne.	Do.	28	55	se.	Do.	27	63	nw.	St. Louis, Mo.	7	51	sw.
Do.	5	58	nw.	El Paso, Tex.	31	54	nw.	Do.	28	51	w.	Do.	10	52	sw.
Do.	6	52	nw.	Erie, Pa.	14	56	se.	Do.	29	53	nw.	Do.	16	51	w.
Do.	19	50	nw.	Do.	16	50	se.	North Head, Wash.	3	54	se.	Salt Lake City, Utah	9	60	w.
Buffalo, N. Y.	8	56	sw.	Do.	17	60	se.	Do.	4	62	s.	Sandusky, Ohio	17	52	sw.
Do.	14	58	sw.	Do.	23	66	sw.	Do.	5	64	nw.	Sandy Hook, N. J.	5	53	sw.
Do.	15	50	w.	Do.	28	56	sw.	Do.	12	66	se.	Do.	17	51	s.
Do.	17	76	sw.	Do.	31	55	sw.	Do.	20	62	s.	Do.	23	52	s.
Do.	18	62	w.	Hatteras, N. C.	18	50	nw.	Do.	21	50	w.	Do.	24	52	s.
Do.	20	52	sw.	Indianapolis, Ind.	23	54	w.	Do.	23	64	s.	Do.	27	56	s.
Do.	23	64	sw.	Lexington, Ky.	31	52	sw.	Do.	25	56	nw.	Do.	29	51	s.
Do.	24	60	sw.	Lincoln, Nebr.	16	54	nw.	Do.	28	74	se.	Sioux City, Iowa	16	56	nw.
Do.	27	64	sw.	Louisville, Ky.	23	52	w.	Pocatello, Idaho	30	50	sw.	Do.	30	50	n.
Do.	28	56	sw.	Do.	31	50	s.	Point Reyes Light, Cal.	5	65	nw.	Syracuse, N. Y.	17	55	s.
Do.	29	64	sw.	Modena, Utah	5	54	w.	Do.	7	52	nw.	Do.	23	60	s.
Do.	31	58	w.	Do.	9	58	sw.	Do.	8	65	sw.	Do.	29	56	sw.
Burlington, Vt.	17	64	s.	Mount Tamalpais, Cal.	2	50	ne.	Do.	9	61	nw.	Tatoosh Island, Wash.	4	60	w.
Do.	23	54	s.	Do.	7	55	nw.	Do.	10	56	nw.	Do.	23	70	sw.
Do.	27	53	s.	Do.	8	59	w.	Do.	11	60	nw.	Do.	28	64	s.
Canton, N. Y.	24	60	sw.	Do.	9	61	nw.	Do.	18	65	nw.	Toledo, Ohio	7	51	sw.
Do.	27	57	sw.	Do.	10	52	nw.	Do.	19	70	nw.	Do.	10	52	s.
Cheyenne, Wyo.	5	54	w.	Do.	14	56	nw.	Do.	20	61	nw.	Do.	14	50	sw.
Do.	6	52	w.	Do.	20	65	nw.	Do.	21	73	nw.	Do.	17	60	sw.
Do.	7	54	w.	Do.	21	64	nw.	Do.	22	57	nw.	Do.	23	53	w.
Do.	23	64	w.	Do.	22	55	nw.	Do.	24	50	nw.	Do.	28	54	sw.
Do.	24	50	w.	Do.	24	62	nw.	Do.	30	61	nw.	Do.	31	50	w.
Do.	25	56	w.	Do.	25	69	nw.	Do.	31	58	nw.	Wichita, Kans.	6	60	w.
Cleveland, Ohio	23	50	s.	Do.	29	50	w.	Port Huron, Mich.	23	50	w.	Do.	7	50	nw.
Do.	28	54	w.	Do.	30	55	nw.	Portland, Me.	5	60	nw.	Do.	9	50	s.
Columbus, Ohio	17	53	w.	Do.	31	55	nw.	Do.	12	56	nw.	Do.	16	52	nw.
Detroit, Mich.	17	53	sw.	Nantucket, Mass.	5	60	e.	Do.	13	50	nw.	Do.	22	52	sw.
Do.	28	54	w.	New York, N. Y.	12	58	nw.	Do.	19	54	nw.				
Duluth, Minn.	14	51	w.	Do.	17	52	nw.	Do.	27	62	se.				
Do.	17	54	nw.	Do.	18	63	nw.	Do.	28	69	se.				
Do.	18	56	nw.	Do.	19	72	nw.	Providence, R. I.	27	50	s.				
Eastport, Me.	5	64	e.												